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IN THIS ISSUE:

- Tenth Anniversary of CJER
- Research Services in California
- Philosophical Dimensions of Empirical Research
- Influence of Interfering Stimuli
- Pictorial Interest Test
- Speech Activities and U. S. History Course

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THE EDITORS SAY:_____

Our Tenth Anniversary

Having been instrumental in starting the *California Journal of Educational Research*, I have been asked to write a guest editorial for this tenth anniversary issue. From a modest beginning the *Journal* has developed into a recognized publication that is serving an important role in California and elsewhere. It is deemed an honor and a pleasure to prepare this "toast" to the *Journal* on its tenth birthday.

CJER was one of several projects undertaken during the early days of the Research Department. Two years earlier a statewide council was sponsored by CTA to help coordinate and stimulate educational research in California. Now known as the State Advisory Council on Educational Research, this group of 12 research specialists was instrumental in helping to set up the *Journal*. It is interesting to note that eight of the original 12 members of the Council, which serves as the editorial board of the publication, are still members of that body.

The first issue made an auspicious beginning. A word of welcome from Dr. Roy E. Simpson said in part, "The decision of California Teachers Association to publish the *California Journal of Educational Research* is one of the most important CTA has made in recent years. . . . The *Journal* will serve as a much-needed clearing house of educational research information from California and elsewhere." An editorial entitled, "We Hope You Like Us!", expressed the role of the *Journal*:

"Frankly, we are not so much concerned about introducing a *new* publication as we are in influencing educators and laymen to the wider acceptance of the role of research in forwarding education.

"We feel that an educational research journal has an important role to play in the improvement of educational services to the children of the State. The *California Journal of Educational Research* will not become the infallible oracle to which all problems of education shall be referred. Rather, we propose to get the results of educational research out of files and bookshelves and into the lives of children."

The *California Journal of Educational Research* began as a bold venture. It has proved to be a worthwhile publication and is accomplishing its original purposes. May the next ten years see even greater improvements!

—Frank Parr.

Dr. Frank Parr became the first California Teachers Association Director of Research and editor of the CJER in 1948 and continued in these capacities until 1953, when he became Special Services Executive for CTA.

Reflections and Refractions of Editor Two

If one were to try to estimate the influence of *CJER* on educational research and practice in California during the last ten years, a monstrosly clever and exceedingly fine instrument would need to be devised. It is doubtful if even the mills of the gods do grind so finely. Nevertheless, we have been proud to publish *CJER* on the sheer faith that the uncontestable good will and professional integrity of its contributors would leave a net residue of benefit to the schools. Let this be a sufficient monument to the past.

It is much more interesting to reminisce into the future, if we may coin a misuse of the language. What shall be significant research in the next ten years? There can be little doubt that much research will be aimed at a "holding action," while still other studies will be conducted for "ground gaining" objectives. Both are going to be needed. In what way is this likely to be true?

The current unrest about the schools appears to stem from a lack of conviction or knowledge that much of what goes on in them is founded on factual discovery. Or if it be conceded that fact is involved, there is expressed doubt that the fact is being applied in the direction in which the schools ought to go. Perhaps the facts should be reviewed; conditions to which they are applicable may have disappeared from many school situations. It would be comforting to have some of the facts re-substantiated.

Even though there be no certainty about the bigness of the voice of *CJER* in educational disquisition during the past ten years, there is no doubt that the voice has been present and accounted for. We shall have no fear that *CJER* will not make itself heard in the immediate years ahead, when so much of this re-examination will occur under the guidance of re-research.

Let us stop here, saying that above all it was a most pleasant companionship for ten years. May there be ten more, and ten again! But over these last we shall not reminisce. Rejoice at the "blast off" into the second ten years, while pondering that only a short ten years ago we would never have even understood the phrase.—Kenneth Brown.

Dr. Kenneth Brown came to CTA in 1948 as Assistant Research Director. In 1953 he became the Director of Research and editor of the CJER, continuing in this role until 1958, when he was appointed Executive for Professional Services.

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The Task Is Not Finished

In the ten years it has existed, the *California Journal of Educational Research* has accomplished much of what was hoped for by its founders. Nevertheless, it is not in a position to say that its mission has been accomplished. It cannot yet quit with a feeling of a job completed. This is due to a number of reasons.

Teachers, like others, are rather slow learners in groups. No matter how effective some individual members of the profession have been in making use of research reported in the *CJER*, the fact remains that there is still a large chasm between research findings and classroom practice. In school and district organization, in finance, and in the utilization of the services of such specialists as psychologists and nurses, there remains much to be put into practice before we can say we are doing as well as we know how. And these are only examples. Of audio-visual techniques, remedial reading procedures, and many other aspects of education the same can be said.

Yes, the field is wide and complex, and there are lots of teachers; but this is not the sole reason why the task of the *CJER* is not completed. Much has happened in the first ten years of its existence. Much is now happening in connection with education. New criticisms of educational procedures have been raised. New techniques are being investigated. Ten years ago there was no study of instructional television going on in the *Journal's* back yard. Now a number of San Francisco Bay Area school districts and teachers are busily engaged in an experimental program with TV Station KQED. (And the Research Department of the California Teachers Association is responsible for its evaluation!)

In short, the second reason that the task of *CJER* is not finished is that educational research is a continuous process. It is just as active in 1959 as it was in 1949, and there is even more need to keep it in close touch with actual school situations. There will always be a task for the *California Journal of Educational Research*. It is the hope of the present staff that they will be able to keep the *Journal* at least abreast of this task. With the help of the authors and other educators in the field, it may even be possible to get ahead of it occasionally.—Garford G. Gordon.

Dr. Garford G. Gordon was appointed Assistant Research Director of CTA in 1953 and became Research Executive and editor of the CJER in 1958.

Provision for Research Services in Large California Public School Systems

HENRY I. WEITZEL

In 1955, the writer investigated the status of public school research workers in cities of 100,000 or more. One of the significant findings of this study was that only about 60 per cent of the school systems represented employed as much as a half-time research worker. The study was reported in the May, 1955, issue of the *California Journal of Educational Research* (Vol. VI, No. 3).

If this can be taken as a fair measure of the extent to which school systems provide for research services in the nation as a whole, it should also be of interest to ascertain the extent to which research workers are employed in the large public school systems of this state. To this end a questionnaire was sent in 1956-57, and again in 1957-58, to the 32 largest unified and "common administration" school districts in California. Only eight of these districts were in cities that had a 1950 population in excess of 100,000. All, however, now have an average daily attendance of more than 10,000, and may therefore be considered "large" school districts.

The questionnaire was a very simple one which could easily be answered in five minutes or less. It merely asked:

1. The name of the person having the principal responsibility for research.
2. The exact title of this individual.
3. His (or her) annual contract salary.
4. Time assignment in school (or calendar) months.
5. Average daily attendance of the school district.
6. The year in which research services were established.

Henry Irving Weitzel has been Director of Research for the Pasadena City schools for the past eight years. Earlier, Dr. Weitzel was Dean of Student Personnel at John Muir College for five years, served as Personnel Officer for the U. S. Coast Guard during the second World War years, and was Counselor at Pasadena City College for 14 years. Previous teaching experience was at Pasadena (high school and junior college), Norwalk (high school), and Oregon State College. Dr. Weitzel, who obtained his doctor of philosophy degree from the University of Southern California in 1933, has been a member of the California Advisory Council on Educational Research since October, 1951. He is joint author of *Principles and Techniques of Guidance*.

A covering letter explained that it was proposed to compile a roster of research workers who devote at least 50 per cent of their time to administrative, educational and/or curriculum research. It was also stressed that, regardless of whether anyone held the title of research director (or other title containing the word research), the name of the person having the principal responsibility for research was desired. The 1956-57 questionnaire was mailed to superintendents of schools; the 1957-58 questionnaire directly to those who had been assigned this research responsibility by their superintendents.

The 32 Largest Districts

The 32 largest unified and common administration districts, i.e., two or more school districts governed by an identical board of education, are frequently chosen for making comparisons of many kinds. The largest of these, Los Angeles, has an average daily attendance in excess of 465,000. The smallest of the 32 has an average daily attendance of a little more than 10,000. Based on the average daily attendance for the school year which ended June 30, 1957, and ranked in order of size, these school districts are listed in Table I.

Provision for Research

Replies were received both years from each of the 32 school systems to which questionnaires had been mailed. Fifteen of them indicated that they did not have a staff member who devoted at least 50 per cent of his time to research. Four of those superintendents named an individual who had the principal responsibility for research but who devoted less than 50 per cent of his time to it. A reply in 7 cases was that research responsibilities were distributed among several staff members. Apparently, only 4 districts had made no provision for research.

On the other hand, definite responsibility for research by a person devoting more than half time to research duties was reported by 17 of the 32 school systems. In alphabetical order, these are: Berkeley, Burbank, Fresno, Long Beach, Los Angeles, Oakland, Palo Alto, Pasadena, Richmond, Riverside, Sacramento, San Bernardino, San Diego, San Francisco, San Jose, Santa Monica, and Stockton. Research was reported to be a full-time job in 11 of these 17 cities.

Titles and Salaries

Twelve of the 17 researchers hold the rank of director, 3 that of supervisor, and 2 the rank of administrative assistant. By far the most common

TABLE I
The 32 Largest Districts

Rank	District	Type	A.D.A.
1.	Los Angeles	C. A.	465,593
2.	San Francisco	Unif.	92,160
3.	San Diego	Unif.	82,530
4.	Long Beach	Unif.	70,687
5.	Oakland	Unif.	60,396
6.	Fresno	Unif.	34,505
7.	Pasadena	C. A.	32,828
8.	Sacramento	Unif.	32,241
9.	Stockton	Unif.	27,620
10.	San Bernardino	C. A.	26,140
11.	Richmond	C. A.	25,622
12.	San Jose	Unif.	23,754
13.	Glendale	Unif.	22,559
14.	Mt. Diablo (Concord)	Unif.	22,220
15.	Riverside	C. A.	19,480
16.	Torrance	Unif.	19,266
17.	Montebello	Unif.	17,916
18.	Burbank	Unif.	17,414
19.	Modesto	C. A.	17,052
20.	Berkeley	Unif.	16,040
21.	Santa Monica	Unif.	15,923
22.	Santa Ana	C. A.	14,512
23.	Vallejo	Unif.	14,058
24.	Alhambra	C. A.	12,938
25.	Pomona	Unif.	11,475
26.	Palo Alto	Unif.	11,310
27.	Alameda	Unif.	10,698
28.	San Leandro	Unif.	10,685
29.	Inglewood	Unif.	10,395
30.	Monterey	C. A.	10,380
31.	Santa Barbara	C. A.	10,275
32.	Bellflower	Unif.	10,072

title held is "Director of Research"; 9 of the 17 have this title. The research assignment, however, is sometimes combined with another assigned responsibility. In the 17 school districts, 8 such combinations were found. The combinations (with research) noted were: administrative assistant (2), evaluation, guidance, IBM, publications, and testing (2).

Fourteen of the 17 research workers are men. The percentage for women (17.6 per cent) in California, while low, is nevertheless much higher than the 9 per cent (approximately) found for the nation at large in the earlier study.

The salaries of research workers in these 17 large school systems show a wide variation. In 1956-57 the range was from \$7,239 to \$13,275; in 1957-58 the variation was from \$9,100 to \$14,200. The 1956-57 mean was \$10,695; the mean annual 1957-58 salary was \$11,412. The percentage increase is 6.7 per cent.

The above data include the salaries of research personnel having different time assignments in calendar months. Burbank, Richmond, Riverside, and Stockton report a time assignment of 10 calendar months for their research workers. All the rest require 12 calendar months, with one month (4 weeks) vacation. When the salaries of research personnel in these four cities are excluded, the 1956-57 mean annual salary becomes \$11,030 and the 1957-58 mean salary \$11,920, for a percentage increase of 8.1. As would be expected, the longer time assignment is reflected in a higher annual salary.

Between the two years, research personnel changes occurred in 4 of the 17 school districts—Berkeley, Palo Alto, Riverside, and Sacramento. In three cases the title of the new person having the chief research responsibility was changed from that of his predecessor. Doubtless a significant amount of administrative reorganization took place also, since in two cases the salaries paid were considerably higher, and in two cases considerably lower, than before.

By excluding the salaries of research personnel in these 4 cities, it is possible readily to obtain figures for the 13 research workers who continued in their same positions in 1957-58. Their salaries showed a range in 1956-57 of from \$8,853 to \$13,275; and in 1957-58 the variation was from \$9,834 to \$14,200. The 1956-57 mean was \$10,818; the mean 1957-58 salary was \$11,874. The percentage increase is 9.8.

Establishment of Services

Long Beach was the first school system to establish a research department (in 1918), closely followed by Pasadena (in 1921). Los Angeles reported that research services were inaugurated there "in the early 20's," San Francisco in 1924, Oakland "prior to 1925," and Sacramento in 1928.

These cities were the research pioneers in the state. Only one school system added research services during the next decade—Burbank in 1934. However, four districts installed research departments in the 40's (Stockton 1941, Berkeley 1946, Riverside and San Diego 1947); and three have been established since 1950 (San Bernardino in 1951, Richmond in 1954, and San Jose in 1956). Three school systems were unable to recall the years in which their organized research began.

Conclusions

1. Whereas about 60 per cent of the public school systems in United States cities above 100,000 in population employ at least a half-time research worker, only 53.1 per cent of the "large" California school systems do so. However, only eight of these systems were in cities over 100,000 in population (1950 federal census).
2. Public school personnel devoting from one-half to full-time to research activities have been added in California school systems in every decade since before 1920.
3. In general, it is probably true that only the larger school districts may be able financially to free a staff member for such a large amount of time to assume purely research responsibilities. However, any school system having 10,000 or more A.D.A. could effectively use the services of at least one full-time research worker.
4. Depending upon the category, salaries of research workers in this state increased, on the average, between approximately 6½ and 10 per cent from 1956-57 to 1957-58. Some **individual** increases were much larger, and some were much smaller, of course.
5. At the present time, research is not being adequately provided for, even in many of California's large school districts.
6. Too many school districts too long have paid only lip service to research. The time to add qualified, competent full-time workers in the areas of administrative, curriculum, or educational research is **now**.

Philosophical Dimensions of Empirical Research in Education

HOBERT W. BURNS

The intent of this article is to elaborate on one simple point: there *is* a philosophical dimension to empirical research, and philosophers of education do indeed have something to contribute to the empiricists of education. More specifically, this paper will attempt to focus attention upon one narrow aspect of educational research: the traditional quest for success-criteria in education.

To say that this is but one narrow aspect is somewhat misleading, for, in another sense, it is the broadest of all educational problems—for philosophers as well as for researchers. The fact that we do have departments, schools, and colleges of education, that we do have an educational curriculum with scope and sequence, that we do teach and train educators, all conjoin to presuppose that we do, in fact, know what does constitute good teaching, good administration, good education.

To presuppose otherwise—to claim, as many educators do, by the way, that the educative process is an elusive, unmeasurable art—is to admit that while we can perhaps recognize good teaching and good administration, we cannot establish any causal connection between theory and practice in education. It is admitting that we do not know how to prepare teachers and administrators because we simply do not know what good teaching or good administration is. In short, we cannot measure because we do not have a yardstick; we cannot evaluate because we do not have a success-criterion.

These problems are not new, nor are most of the proposed solutions to these problems. And it needs to be made clear that this paper does not pretend to answer these problems. What is new, however, in the search

Robert Warren Burns is an Assistant Professor of Education at Rutgers University, New Brunswick, New Jersey. Prior to his appointment at Rutgers he taught in the secondary schools of Los Angeles, Burbank, and Palo Alto, California. Dr. Burns received his doctorate from Stanford University in 1957. This article is condensed from an address delivered to the American Association for the Advancement of Science, December, 1958.

for educational success-criteria, is the increasing utilization of the critical incident technique (3) by the empiricists in education.

This technique is being used as a primary methodological tool by an ever-increasing number of educational researchers—witness the quantity of recent doctoral dissertations from universities throughout the nation, or the vital studies carried out under the auspices of the Cooperative Program in Educational Administration (CPEA), which relied heavily on the validity of this technique (4). It is with this phenomenon in particular that this paper is concerned.

The technique has been the subject of review elsewhere (1), so it need not be explicated at length here. A brief statement, however, is in order in that much of what follows is concerned with the increasing utilization of this technique by educational psychologists, educational sociologists, educational administrators, and health and guidance educators.

The critical incident technique itself, according to John C. Flanagan, its innovator, consists of

... a set of procedures for collecting direct observations of human behavior in such a way as to facilitate their potential usefulness in solving practical problems and developing broad psychological principles. The critical incident technique outlines procedures for collecting observed incidents having special significance and meeting systematically defined criteria. (3:327)

The heart of the critical incident technique is that it claims to isolate certain behaviors which are "critical" in the sense that they are necessary requirements for the successful achievement of any given task. Flanagan sums up in this manner:

... the critical incident technique, rather than collecting opinions, hunches, and estimates, obtains a record of specific behaviors from those in the best position to make the necessary observations and evaluations. (3:355)

The significant question, as far as the theme of this paper is concerned, then becomes: What can the critical incident technique achieve in the search for educational success-criteria?

Certainly it can reveal [reports of] the perceptions of the observers who are employing the technique. To assert this it need only be assumed that the report of perception is honest and accurate, and this is a defensible assumption. To assume otherwise, to assume that an individual's perceptual report is erroneous, is to make an untestable—as well as uncharitable—assumption. Thus the critical incident technique can be of use in studies which attempt to determine [reports of] perceptions and, if in the quest for success-criteria, a researcher should seek to identify perceptions of teaching or administrative success, he could profitably employ the critical incident

technique. Building upon this property of the technique, it follows that if there is a sufficient degree of intersubjectivity (i.e., perceptual agreement) within a group of observers, then it can also be claimed that the technique reveals the objective behavior exhibited by the subject(s) being observed. A second property of the critical incident technique, then, is that it can reveal the existence (or non-existence) of behavioral phenomena.

These two conclusions, which concern behavior and perceptions of behavior, may seem obvious to the point of asininity and not very heavy, intellectually speaking. But in point of cold, hard analysis that is *all* the critical incident technique can achieve in any field of research.

The behavior which is perceived through the use of the critical incident technique has only one single, raw quality: existence. Any other quality, any adjective, that is prefixed to the observed external behavior is actually a property of our *conceptions* and not of our *perceptions*. These surplus properties—that is, qualities over and above existence—are not an existential part of the behavior and therefore could not be a part of our perceptions of the behavior. They are, instead, something we ourselves contribute.

This being the case, to qualify or describe behavior in any way other than to assert its existence is to make a value-judgment about that behavior. The assignment of value necessarily presupposes that criteria of value already exist in our conceptions; *thus when we say that a certain behavior is "successful" or "unsuccessful," we are not so much describing that behavior as we are comparing that behavior against some pre-existing criteria of success, and then issuing a report that the behavior under observation fulfills the demands of those criteria.* This quite evidently is the process of valuation.

From all this it follows (and even though this is somewhat of an elementary conclusion, many educational researchers do not seem to be aware of it) that the critical incident technique cannot be used to *discover* "successful" teaching, administration, bomb-dropping, pilot training, or chess playing. However, it does *describe* teaching, administration, bomb-dropping, pilot training, and chess playing; but as a technique it cannot and does not evaluate.

It is, in sum, a valuable empirical tool; but as with all empirical tools it doesn't reveal or discover values that supposedly exist in the cosmos, or in individual or collective behavior, because values are not discovered but created.

If this analysis is valid, then research projects which use the critical incident technique to discover success-criteria in education are deceptive and unreliable. This is a rather harsh conclusion, but it does follow because the criteria of success must exist in our concepts before we can perceive specific examples of successful behavior.

Thus, the *establishment* of success-criteria in education does not require the use of the critical incident technique. The establishment of these cri-

teria is primarily a philosophic problem, requiring the use of such philosophic tools as logical analysis, with which candidates for membership among the success-criteria can be created.

Once we have completed the philosophic task, and we have agreed as to what constitutes success—and if the criteria have been behaviorally defined—then, and only then, can the researcher turn to empirical techniques for verification.

If educational philosophers permit educational researchers to continue to assume, happily, that the critical incident technique—or any other empirical technique—will in and of itself permit the identification of the criteria of success, and stamp those criteria with the mark of scientific respectability, then educational philosophers are guilty of letting educational researchers indulge in wishful thinking.

"Very well," one may say, "the analysis is convincing and it must be admitted that methods such as the critical incident method cannot fruitfully end the quest for educational success-criteria. It is admitted, too, that here is one dimension where philosophic analysis does make a contribution to empirical research in education. But this is an instance of individualization, of specification. What is the generalization? What, so to speak, is the moral of the example of success-criteria and the critical incident technique?"

The moral, so to speak, is that the success of any given scientific technique in one field does not, and cannot, guarantee its success in another field. Many educational researchers, impressed with the enviable success of the methods utilized in the physical sciences, have all too often carried these techniques hastily and uncritically into the field of education—only to meet with frustration and disillusionment.

Philosophers of education can, at this point, make a significant contribution to educational researchers by insisting that before the initiation of inquiry the nature of the problem be thoroughly examined, the nature of the instruments of research be thoroughly examined, and further, provide them with the philosophic tools with which to make such examinations. Philosophers must point out to researchers the tautology that commitment to an instrument is commitment to all the prior assumptions, explicit or implicit, which justify the existence and use of that instrument—for the researcher who accepts for use any instrument of inquiry also, thereby, accepts as valid the assumptions which underlie the instrument.

Too often the researcher in education will seize upon a technique of science that has been signally successful in another field and apply it to a problem in his own field. But the first thing to do in the initiation of inquiry is not to start with any given method; rather, as Dewey has pointed out (2), inquiry must begin precisely with what the researcher has at the beginning: the indeterminate situation. This is where all inquiry must initiate, for it is this situation and its characteristics as revealed by philo-

sophic analysis, that must guide researchers to the relevant facts and to the relevant hypotheses and thence to the relevant methods of testing and verifying.

For illustration, let us return briefly to the example of the critical incident technique and the problem of success-criteria. The question of what constitutes teaching or administrative success is, obviously, a normative question—and it seems clear that a scientific technique appropriate for answering a question concerning what *ought* to be the case must, in some way, be different from a technique which answers a question concerning what *is*, in fact, the case.

But this distinction in itself may arouse disagreement for it is fashionable to assert that problems of fact and problems of value are quite identical—with only the content differing—and thus that both are to be solved by one and the same method.

But the theory that the method defines or determines the scientific character of the problem is in error, for inquiry does not start with a method. It starts with a problem situation. It is the problem, as analyzed out of the indeterminate situation, that designates the method, and not the method that designates the problem.

It is not being suggested that problems of fact and problems of value are distinguishable in that the former are answerable by scientific methods—while the latter are not. The difference is that problems of value must be reduced to problems of fact, if it is ever to be said that certain normative statements are cognitive and true—for to say that a proposition is true is to answer a question of fact. Both are to be resolved by the techniques of science; but in each case the technique is not identical.

This is why many of our researchers have failed to resolve educational problems that are of a normative nature: They have failed because many of them have a faulty, or incomplete, conception of the method of inquiry—or, at least, so we are led to believe by their studies in normative areas such as those in search of success-criteria.

The crux of the problem lies in the initiation of inquiry; in the analysis of the problematic situation.

"But why," one might want to ask, "why is this so—if it is so?" The answer is not difficult to find. Too many educational researchers apparently assume that science is the method of doing, of acting, of experiment. In the desire to obey the Law of Parsimony they have eliminated philosophy—the method of reflection—from consideration; philosophy and science have been divorced.

Put otherwise, many educational researchers apparently have a *a priori* conception of the scientific method, and having this *a priori* conception they supposedly know how to handle educational problems in a scientific manner without indulging in any philosophic analysis of their problems.

But until it is recognized that science—and this must include some

(Continued on page 47)

Influence of Interfering Stimuli on Perception of Meaningful Material

LUTHER C. GILBERT

The purpose of this study was to determine the amount of interference which resulted when a competing stimulus was thrown on the same group of rods and cones immediately following or immediately preceding the presentation of words or phrases of sense material. If interference results, will it be more in the direction of proactive or retroactive influence? Are there individual differences in ability to grasp the sense material in spite of interference? The evaluation of these interfering stimuli will be limited in this section of the study to an evaluation of their influence when the eyes are functioning without saccadic movements.

In the first section of this experiment attention was devoted primarily to the problem of identifying a visual stimulus which exercises maximum influence in disrupting the use of after images in the perception of words and phrases. However, the unevenness of the influence of the various stimuli on individuals was noted. These individual differences indicate the magnitude of the problem of visual perception of words and phrases among college students.

Subjects

The 68 subjects used in this part of the study were all upper division and graduate students enrolled in Educational Psychology classes on the Berkeley Campus of the University of California. For all of them, the native language was English.

The vision of the experimental group was tested by asking each subject if he or she could see clearly the words as they appeared on the screen.

Luther C. Gilbert, Professor of Educational Psychology, Emeritus, at the University of California at Berkeley, obtained his doctor of philosophy degree from the University of Chicago in 1931. Dr. Gilbert previously taught at the University of Virginia and the University of Chicago, and has been at U.C. for 28 years. He is the author of three psychological monographs and numerous articles in educational psychology.

Any who reported that the words blurred were eliminated from the study. Only six subjects were lost for this reason. A further check on the vision was made by flashing two-word phrases (all simple, short words) on the screen for 1/24 of a second without an interfering stimulus following. The 68 subjects reported correctly 98.4 per cent of these words. It seems reasonably certain that defective vision or lack of familiarity with the simple words used in the phrases were not important factors in the results.

Materials

The phrase material used throughout the study was all typed on an IBM Executive Typewriter using Warren High Gloss paper and black carbon ribbon. The material was photographed with a Cine-Kodak Special II 16 mm. camera at a distance of nine inches, which gave a large clear type on the screen. Cine-Kodak Super X Reversal Safety Film was used in the negative form which produced black words on an egg-shell color background. This soft egg-shell color background reduced the problem of glare. A Bell and Howell projector set at 24 frames per second was used for flashing the material on the screen.

A blank page of the Warren High Gloss paper was photographed, using enough film to permit the projector to run for three seconds before the words appeared, then two seconds after they disappeared. This allowed time for starting and stopping the projector and at the same time controlled the illumination on the screen just before and following the material.

In evaluating the retroactive influence of interfering stimuli on the visual perception of sense material, different types of stimuli were used:

1. A 2-inch black square superimposed on two words.
2. A small black rectangle (just large enough to cover the words) superimposed on two words.
3. Upper case X's superimposed on one word and on two words.
4. One word superimposed on one word and two words on two words.
5. Nonsense letters superimposed on two words.

The character of material and the same procedure were used in testing both retroactive and proactive influences of these stimuli, with the exception that the procedure was exactly reversed for the two. For the proactive influence the interfering stimuli were presented first.

The tests were all prepared by photographing the words on one frame of the motion picture film, then photographing the second stimulus on the next frame. This meant that the words appeared on the screen for 1/24 of a second and were followed immediately at the same place on the screen by the interfering stimuli. In evaluating the proactive influence of the same stimuli the procedure used in the first five tests was reversed. This meant that the interfering stimuli appeared on the screen for 1/24

of a second and were followed immediately at the same place on the screen by the words. The words were exposed for 1/24 of a second.

Findings

The data presented in Table I show that the large black squares used in this experiment had no measured influence on the visual perception of the words. When a ribbon of black was superimposed on the words, there resulted a loss of about 1 per cent. Only six subjects missed as many as four words out of the 20 possible. In five of the six cases the four words missed constituted two pairs of words. This indicates the presence of some factor which did not exercise a constant influence. The few mistakes made on each of these tests may have been more accidental in nature than casually associated with the interfering stimuli.

The third stimulus used was the upper case X's. Unlike the solid black stimulus, the X's were associated with a substantial loss in visual perception of the words. The data revealed wide individual differences in ability to avoid interference from the X's. The range was from 0 per cent to 95 per cent correct. Three of the subjects who were very slow in visual perception were unable to recognize any of the words. These three subjects reported that they did not see any of the words. Two of them did not believe that words were being flashed on the screen (these two subjects got all of the 20 words which were followed by the black square and ribbon). A few of the subjects reported that they could see the two words but could not hold the visual stimulus long enough to identify the words. Two subjects reported accurately 19 of the 20 words flashed on the screen.

The fourth stimulus used was two words on two words. Here the subjects experienced far more interference than they did from the X's. When X's were superimposed on the words, the average loss was 48.9 per cent. However, when other words were used as competing stimuli, the loss of the first two words was 82.5 per cent. It seems that most of the subjects were simply not able to process the visual stimuli of the first two words with sufficient speed to avoid interference from the second two words. Twelve of the 68 subjects did not get any of the first two words, while three subjects saw and reported 70 per cent or more of the first two words. The evidence suggests that some college students need more time than others to differentiate between visual stimuli resulting from printed words.

The fifth stimulus used, and reported in Table I, was nonsense letters, typed in lower case on the same IBM typewriter used to type the words. The letters were typed in random order and in a manner to avoid the formation of sense material. The procedure used in presenting the other stimuli was used with the nonsense letters. This test proved far more diffi-

cult than the other four tests. When the nonsense letters were superimposed on two words, less than 4 per cent of the words were correctly identified. The range was from 0 per cent to 20 per cent correct. While the test of nonsense letters proved too difficult to bring out the full range of individual differences in the speed of processing visual stimuli of printed words, it did identify a test which proved useful in other parts of the study.

TABLE I

Retroactive Influence of Various Types of Interfering Stimuli on Perception of Meaningful Material

(Expressed in Mean Per Cent of Words Correctly Reported)

Type of Stimulus	Large Black Square on Two Words	Black Ribbon on Two Words	X's Imposed on Two Words	Two Words Imposed on Two Words	Nonsense Letters Superimposed on Two Words	X's Imposed on One Word
No. of Subjects	68	68	68	68	68	68
Mean Per Cent Correctly Reported	99.0	97.3	51.1	17.5	3.68	69.7
S.D.	3.84	6.61	22.78	19.19	.99	26.86

Table II presents data showing the proactive influence of the interfering stimuli. The proactive influence was checked by reversing the procedure used in the study of the retroactive influence. This means that the interfering or competing stimuli were presented first, then followed immediately by the words. It seems quite clear from these data that the black squares and the black ribbon exercised very little, if any, measured influence in either direction. The retroactive influence of interfering stimuli used in Tests 3, 4, and 5 is far greater than the proactive influence. The results of Tests 3, 4, and 5 indicate that the greater the retroactive interference of a stimulus the greater the tendency for the stimulus to exercise a proactive interference. From the introspective data gathered from the subjects, it seems that a strong interfering stimulus may interrupt the processing of the visual stimulus of words at various stages. The arrested development may take place at a stage which prevents the subject from becoming aware that there was a stimulus. He may be aware of the stimulus but not be able to identify it as a word. He may be aware of the fact that he saw one word or two words, and even that he saw the letters in the words and still

not be able to hold the stimulus long enough to identify the words or the letters. The evidence presented suggests that there are marked individual differences among college students in the speed with which they can process the visual stimuli of printed words.

TABLE II

Proactive Influence of Various Types of Interfering Stimuli on Perception of Meaningful Material

(Expressed in Mean Per Cent of Words Correctly Reported)

<i>Type of Stimulus</i>	<i>Two Words Superimposed on Large Black Square</i>	<i>Two Words Superimposed on Black Ribbon</i>	<i>Two Words Superimposed on X's</i>	<i>Two Words Superimposed on Two Words</i>	<i>Two Words Superimposed on Nonsense Letters</i>
No. of Subjects	68	68	68	68	68
Mean Per Cent Correctly Reported	97.5	97.6	93.0	83.0	47.5
S.D.	7.11	5.22	13.45	12.18	4.53

SPREAD OF INFLUENCE OF INTERFERING STIMULUS

Another phase of the influence of the interfering stimulus on perception of words is the extent to which it can destroy or change part of a stimulus pattern and leave the other part uninterrupted. Table III presents data showing that if two words are presented on the screen and then X's are immediately superimposed on one of these two words but not on the other, a substantial interference is manifest on the superimposed word but only a minor interference can be detected on the other word. One part of a span of perception may be interfered with while leaving the other part with little or no measured interference.

There are marked individual differences in the spread of the influence of the superimposed X's. A number of the subjects (eight of the 68) were able to get only 70 per cent or less of the unimposed words, while the group reported these same words with 91.4 per cent accuracy. It is possible that this spread of interference is due to individual differences in ability to avoid the interference resulting from distractions of this kind.

TABLE III
Two Words with X's Superimposed on One of the Two Words
 (Expressed in Mean Per Cent of Words Correctly Reported)

	<i>Per cent of Unimposed Words— Right and Left Words Combined (1 + 4)</i>	<i>Per cent of Imposed Words— Right and Left Words Combined (2 + 3)</i>	<i>Per cent of Imposed Words on the Right (2)</i>	<i>Per cent of Imposed Words on the Left (3)</i>
Number of Subjects	68	68	68	68
Mean Per Cent Correctly Reported	91.4	63.5	28.8	34.7
S.D.	20.77	53.68	25.55	31.78
Example:	1 nine	2 fish XXXX	3 many XXXX	4 roads
	1 & 4 unimposed words 2 & 3 imposed words			

TABLE IV
Two Words with Extra Word Superimposed on One of the Two Words
 (Expressed in Mean Per Cent of Words Correctly Reported)

	<i>Per cent of Unimposed Words Right + Left (1 + 5)</i>	<i>Per cent of Imposed Words Right + Left (2 + 4)</i>	<i>Per cent of Unimposed Words (3 + 6)</i>	<i>Per cent of Imposed Words Right (2)</i>	<i>Per cent of Imposed Words Left (4)</i>
Number of Subjects	68	68	68	68	68
Mean Per Cent Correctly Reported	90.2	12.3	91.9	8.3	4.0
S.D.	11.85	22.55	13.73	13.84	11.83
Example:	1 next	2 year week 3	4 two four 6	5 boys	
	3 & 6 Unimposed (they were superimposed on 2 & 4) 2 & 4 Imposed Words 1 & 5 Unimposed Words All words exposed for 1/24 of a second				

In place of destroying part of a phrase, is it possible to change part of it after the stimulus has reached the retina? Table IV presents data showing what happens when the words **three boys** were flashed simultaneously on the screen for $1/24$ of a second and immediately following, the word **four** was presented for the same length of time and at the same place on the screen where the word **three** had appeared. In spite of the fact that the words **three** and **boys** each remained on the screen for exactly the same length of time, nearly 90 per cent of the subjects wrote **four boys** as the words they saw. Many of the slow reacting subjects said that they did not see a third word. A few reported that they got a good look at the word **three** but could not hold it long enough to tell what it was. A few of the subjects with very fast perception were able to see and report accurately all three words.

The data, gathered from the study of the influence of interfering stimuli on the perception of sense material, give us a better understanding of the degrees of individual differences in visual efficiency among college students. The data bring to light the fact that inaccurately processed visual stimuli of sense material tend to produce a greater spread of proactive interference than accurately processed material. They bring to light the fact that different visual stimuli exercise different amounts of both proactive and retroactive influence.

Since some subjects experienced more interference from imposed stimuli than others, the findings of this section give rise to other questions regarding speed of perception.

LENGTH OF THE FIXATION PAUSE AND THE INFLUENCE OF IMPOSED STIMULI

The evidence points to the fact that certain individuals should have a reading pattern with substantially longer fixation pauses than is found in other individuals. Some subjects experience greater interference from competing stimuli than others. This raises the question as to whether or not the variation in the length of the first stimulus might not cause a variation in the interference on the second stimulus. Should this prove to be true, would the increase in the length of the first stimulus increase its proactive influence on the second stimulus? The question is approached in Table VA. When one word is flashed on the screen for $1/24$ of a second followed by a second stimulus which is left on the screen for the same length of time as the first word, the second word exercises a substantial retroactive influence on the first word, while the first word exercises a slight proactive influence on the second word. When the first word is left on the screen for $2/24$ of a second, the retroactive influence of the second word is greatly reduced without a substantial change in the amount of

proactive influence by the first word on the second word. When the first word is left on the screen for 4/24 of a second, there is very little evidence of retroactive or proactive influence.

TABLE VA

**Influence of the Duration of the Stimulus on the
Retroactive and Proactive Interference**

(Expressed in Mean Per Cent of Words Correctly Reported)

	<i>One Word Span</i>	<i>One Word Superimposed on One Word</i>					
	1/24	1/24	1/24	2/24	2/24	4/24	4/24
First Word							
Second Word	Blank (1)	1/24 (1A)	1/24 (1B)	1/24 (2A)	1/24 (2B)	1/24 (3A)	1/24 (3B)
Number of Words	20	20	20	20	20	20	20
No. of Subjects	68	68	68	68	68	68	68
Mean Per Cent of Words Correctly Reported	98.6	26.7	95.8	89.2	97.1	99.4	98.1
S.D.	5.45	17.57	10.89	15.65	9.11	3.33	5.41

Note: (1) The first word was exposed for 1/24 of a second and followed by a blank screen.

(1A) The first word was exposed for 1/24 of a second and followed immediately at the same place on the screen by the second word, which was exposed for 1/24 of a second. Subjects were instructed to get the first word.

(1B) Same procedure as 1A, except the subjects were instructed to get the second word.

The other tests followed the same general pattern, the exception being that in 2A and 2B the first word was exposed for 2/24 of a second, while in 3A and AB the first word was exposed for 4/24 of a second.

When the span was increased to two words, the subjects experienced an increase in both retroactive and proactive influence. As seen in Table VB, an increase in the length of time the first two words remained on the screen reduced the retroactive influence of the second two words on the first two words. At the same time there was no substantial increase in the

amount of proactive influence resulting from increasing the length of the first stimulus. However, using a span of two words there was still some interference in both directions when the first pair of words was left on the screen for 4/24 of a second. This would seem to indicate that the average college reader will need fixation pauses which will average better than 4/24 of a second in duration if he is to use a span of perception of more than one word and avoid interference from the stimuli resulting from succeeding fixation pauses.

TABLE VB

**Influence of the Duration of the Stimulus on the
Retroactive and Proactive Interference**

(Expressed in Mean Per Cent of Words Correctly Reported)

First Pair of Words	<i>Two Word Span</i>	<i>Two Words Superimposed on Two Words</i>					
	1/24	1/24	1/24	2/24	2/24	4/24	4/24
Second Pair of Words	Blank (1)	1/24 (1A)	1/24 (1B)	2/24 (2A)	1/24 (2B)	1/24 (3A)	1/24 (3B)
No. of Word Pairs	20	20	20	20	20	20	20
No. of Subjects	68	68	68	68	68	68	68
Mean Per Cent of Words Correctly Reported	97.6	17.5	83.0	65.7	88.2	91.6	87.1
S.D.	9.12	19.19	12.18	24.73	13.61	11.60	17.45

Note: (1) The first two words were exposed for 1/24 of a second and were followed by a blank screen.

(1A) The first pair of words was presented for 1/24 of a second and was followed immediately at the same place on the screen by the second pair of words, which was exposed for 1/24 of a second. The subjects were instructed to try to get the first pair of words.

(1B) Same as 1A, except that the subjects were instructed to get the second pair of words.

The other tests followed the same general pattern, the exception being that in 2A and 2B the first words were exposed for 2/24 of a second. In Tests 3A and 3B the first pair of words was exposed for 4/24 of a second.

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Research Implications Of a Pictorial Interest Test

HAROLD GEIST

The difficulties associated with verbal tests have been plaguing those concerned with vocational guidance for some time. Steffire (5) has calculated the reading difficulty level of interest inventories in terms of grade placement¹ on the Stanford Reading Test.

Test	Vocabulary Difficulty	Polysyllabic Words	Vocabulary Diversity	Vocabulary Mass
Brainard	6.4	7.1	8.8	6.2
Kuder	8.4	6.2	16.1	6.4
Lee-Thorpe (adv.)	6.8	8.2	16.9	10.9
Allport Vernon	11.3	10.4	9.2	8.2
Strong (men)	10.4	14.7	15.9	14.6
Cleeton	12.0	14.4	16.9	12.5

¹The highest grade placement obtainable with the formula used was 16.9.

Harold Geist is a clinical psychologist who has been serving as Consulting Psychologist for the Pittsburg School District for the past year and a half. Dr. Geist has studied at Cornell, Columbia and Stanford universities, obtaining the doctor of philosophy degree from Stanford in 1951. He has done psychological work with the armed forces and the Veterans Administration, and was panel psychologist for the Oakland branch, Bureau of Vocational Rehabilitation, State Department of Education. Prior to coming to the Pittsburg District, Dr. Geist was Supervising Clinical Psychologist for the Solano County Schools. The author would like to thank the following schools and districts. In California: Albany, Brentwood, Hayward, Oakland, Pittsburg, and San Leandro, and the University of California; in Puerto Rico: Central High School, the Demonstration School of the University of Puerto Rico, the Miguel Such Trade School and the University of Puerto Rico; in Hawaii: McKinley High School and the University of Hawaii. He would also like to thank Miss Cristina Batista of the College of Education of the University of Puerto Rico and currently a graduate student at the School of Education, University of California, and Mr. Carl Clarke of the University of Hawaii for their assistance in Puerto Rico and Hawaii respectively.

Johnson and Bond (2) report the reliability of 19 commonly used tests and found the grade level of the Minnesota Multiphasic Personality Inventory to be 6, and the grade level of the Army General Classification Test (Civilian Edition) to vary from 5.5 for the directions to 10 for some of the middle items. West (8) has proposed using the Kent EGY (Kent Series of Emergency Scales) and the vocabulary section of the Gates Reading Survey in an interview situation as an "emergency diagnosis" to plan further testing and alleviate the reading difficulties by not giving further tests to the testee whose reading level may be too difficult for him.

A trend in current testing is to "get away" from verbal testing and to rather employ the pictorial method of assessing various traits. The earliest attempt to measure interests by means of pictures was made by Giles (1) in 1936. Super and others (3,6,7) have also worked with pictures in the measurement of interest. Super and Roper (6) have shown that memory for material in an occupational motion picture can be used to distinguish nurses from non-nurses. Pierce-Jones and Carter (4) report on an occupational interest inventory patterned on the Kuder with moderately high reliability and fair correlations with comparable scales of the Kuder.

For a number of years now, E. K. Strong, Jr. and the writer have been engaged in the construction and standardization of a picture vocational interest test. Such a device, it was thought, would have great value in motivating children (and adults) to study more about occupations and hobbies, and as a measuring device would eliminate many of the semantic difficulties of the verbal tests, as well as serving as a tool in assessing the motivational force behind occupational choice. The transcultural value of such an instrument can readily be seen because of the elimination of words.

Description of Test

The test consists of 129 pictures of occupations² and 3 of hobbies.³ The pictures are presented in triad form with a forced choice selection of one of the three pictures. Scoring categories are the same as the Kuder with the addition of a dramatic scale. The test was standardized on male school children in grades 8-12, in college, and trade school in this country, Puerto Rico and Hawaii. Mean reliabilities for *all* scales (6 months test retest) for each cultural group are shown in Table I.

Because of the obvious implication of youngsters who have difficulty

²At the present time this test is for males only.

³The justification for inclusion of hobbies or avocations with occupations is shown by Super, Donald, *Avocational Interest Patterns*, Stanford Press, 1940.

in reading, a standardization was also done on remedial reading groups with the following reliability figures:

	N
9 grade — .59	50
10 grade — .70	60

Validation was done by correlation with the comparable scales of Kuder. There is also a projective portion of the test where motivating forces behind occupational choice are assessed by asking the testee questions about the pictures of choice. These motivating forces are in the areas of prestige, finance, environment, family, personality, and past experience.

TABLE I
Reliabilities

	United States		Puerto Rico		Hawaii			
	N		N		N			
Grades								
8-12	.70 (mean)	255	.71 (mean)	100	.71 (mean)	195		
University								
(California)	.89	60	(Puerto Rico)	.75	58	(Hawaii)	.80	50
Trade School	.69	55		.75	50			

Research Implication

The transcultural value of such an instrument is extensive because representation of occupations is made pictorially rather than verbally. One research project, which the author has already made which was incidental to the standardization, has provided useful information regarding occupational choice in a peripheral American culture (*i.e.* Puerto Rico). As part of the reliability standardization, the choices for each of the pictures for each person who took the test were calculated in the United States and Puerto Rico. This in essence is a criterion of the popularity of each of the choices or pictures. In general, in both cultures in the high school and university samples the most popular choices were in the highly technical professions directly related to our atomic age, despite the fact that Puerto Rico still has a predominantly agrarian economy. Still more interesting were the choices in the vocational schools. In the United States only 4 of the 18 most popular occupations selected by students in a vocational school in Oakland, California were in the skilled group, and, as a matter of fact, two of these were in the unpopular group, welder and machinist. The

selections of the vocational students in Puerto Rico, on the other hand, were more closely related to the skilled trades, indicating that in the United States choices of vocational students were different from the area which they were studying. The cultural implications are not restricted to the study in different sections of the world. Much research is needed in the area of vocational choice in different sections of this country.⁴ Since this instrument actually assesses choice of occupations, use of this instrument will enable guidance workers and sociologists to assess the amount of occupational information in different sections of the country and other parts of the world. The sociological implications are also enormous. For example, in the assessment of motivating forces, what are the differences between the various socio-economic and socio-cultural groups in motivation for entrance into an occupation? To what extent do prestige and financial rewards play a part in the choice of youngsters in the lowest and highest socio-economic groups? These and other interesting research implications open the way for exploration of the many faceted highway of vocational choice.

⁴Supplements are being prepared for 9 different geographic areas in this country which will complement the basic test.

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Speech Activities and the United States History Course

WALDO W. PHELPS, L. DAY HANKS,
and HAROLD NEEF

Experimental evidence supports the contention that problem-solving panel forums may successfully be included in the high school Civics course.¹ The present study continues to explore the influence of speech activities on learning social science subject matter—specifically United States history. Two approaches to teaching the course, in terms of student oral participation, were employed. In one approach, the oral work consisted of questions by the teacher and answers by students, informal class discussions led by the teacher, and an occasional oral report. The second method included the foregoing oral activities and, in addition, panel discussion, debate, original oratory, oral interpretation, and extemporaneous and impromptu speaking.

The following questions were asked:

1. Is there a difference in the amount of basic United States history content learned when the indicated teaching methods are compared?
2. Is there a difference in the extent to which students fulfill the promise of their IQ's in learning United States history when the indicated teaching methods are compared?
3. Is there a difference in the gains made by low, middle, and high IQ groups when the indicated teaching methods are compared?
4. Is there a difference in the gains made by low, middle, and high rankings, as established by the initial examination in history, when the indicated teaching methods are compared?

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Louis Day Hanks is a speech and history teacher at John Marshall high school in Los Angeles, a position he has held for ten years. A graduate of Occidental College, he obtained his master's degree in 1933 from the University of Southern California. He previously taught at high schools in Banning and Norwalk.

Harold Herbert Neef is a history and driver education teacher at John Marshall high school, Los Angeles, where he has taught for eleven years. A graduate of Albion College, Michigan, Mr. Neef obtained his M.A. from the University of Southern California in 1932. He has taught at Burbank high school and Los Angeles evening school.

Procedure

This study was an attempt to measure quantitatively by means of course content tests, the relative effectiveness of teaching United States history in one case by the traditional pattern of instruction and in the other by essentially a speech activity centered approach. United States history II (post civil war to the present) was selected as a suitable social science course for the study. Written examinations, prepared by a national testing agency, were obtained. A standardized and impartial measuring instrument of 120 true-false, completion, and matching questions was employed. It seemed desirable in this study to employ two teachers in the experiment. A large sample was consequently obtained, and in contrast to the Civics project² each teacher was experienced, skilled, and genuinely enthusiastic about his particular approach to teaching history. The experimental procedures were to designate 115 experimental and 118 control subjects, to administer the content test at the beginning of the semesters, to impose experimental technique on the experimental group while holding the controls to the traditional method, to administer the content test again at the end of the semesters, and to compare the two groups in terms of gains in mastery of course content. On the basis of intelligence quotients and positions on the United States history learning curve (results of first test score), sixty-seven pairs of subjects were matched from the experimental and control groups. The gains of these two groups were compared, and appropriate correlations were determined.

One teacher taught two United States history classes during each of two semesters (four classes in all) by the traditional method. In these classes, which formed the control group, the textbook³ was followed closely and studied in detail. General procedure was either to have students outline a chapter or write out answers to questions included in the text. In addition, written reports on famous men or important events were included; a few students presented these as oral reports. The instructor lectured frequently and conducted quiz type recitations. On occasion classes would become involved in informal discussion of current events; this was particularly true with the two advanced groups. Oral work thus was at a minimum, and was entirely teacher led and directed.

A second teacher also taught one advanced and one regular class in United States history II during each of two semesters. In these classes, which formed the experimental group, student speaking ranged from answering questions in the text under the guidance of a student chairman to formal "game" type debate. Individual speaking varied from the impromptu speech to the written, prepared "oration." Students were not forced to participate in the speaking. Less than twenty per cent, however, took part only as listeners, and turned in extra written work in lieu of the oral.

Generally the speech activities followed reading and discussion of the text, although on occasion they were integrated into the reading-text discussion periods. Approximately fifty per cent of the total class time in the experimental sections was allocated to speech activities as the basis for class learning. Actual instruction in speech was of necessity somewhat limited.

Equating Experimental and Control Groups

Each instructor was assigned a high and an average IQ group each semester, but no feasible means of precise matching of students before the semester began could be found. Thus, the experimental and control groups could not be compared as groups without manipulating the membership. The individual pair technique therefore was applied because it insures that the means and dispersions of the capacity scores will be the same for both groups. Moreover, since two criteria provide a more valid basis for matching, both the IQ scores from the Otis test and the score made on the content test given at the beginning of the semester were used in the matching. This combination theoretically placed the mates at the same position on the learning curve at the beginning of the semester and paired them in terms of potential learning ability as well.⁴

Pairs were matched only when the amount of difference between scores did not exceed ten per cent of the range for either of the matching criteria.⁵ The foregoing procedure resulted in the matching of twenty-nine pairs for the first semester and thirty-eight for the second. The total of sixty-seven matched pairs thus formed the basis for the experiment.

The sixty-seven matched pairs were cumulatively equal in means of capacity scores and in shape of distribution. No significant differences existed in the mean IQ's and their corresponding standard deviations, or between the mean initial history test scores and their corresponding standard deviations. Further evidence was obtained by computing the coefficient of correlation between IQ's and first test scores. The coefficient for the control group was $+0.68$, and for the experimental group $+0.65$. There was no significant difference between the two coefficients, and it was concluded that the sixty-seven experimental and control group pairs were evenly matched at the start of the semesters.

Analysis of Data

Given this evenly matched start, was there a significant difference between the gains made by experimental and control groups? The mean of the differences between gains for the sixty-seven matched pairs was 1.24; the standard error of the mean difference was 1.38. Thus, there was no significant difference between the amount of gains in history course content

achieved by the pairs taught by the traditional pattern of instruction and the pairs taught by a speech activity centered approach.

Were the experimentals more variable in gains than the controls? The standard deviation of the former was 7.47; that of the latter was 9.40, a difference of 1.93. The standard error of the difference was .84; dividing the difference by its standard error yielded a *t* of 2.29. The chances are therefore 90 to 1 that the derived difference was significant. The controls may thus be regarded as approximately one-third more variable in gains than the experimentals.

Did the gains of the experimentals correlate more highly with intelligence than those of the controls? The coefficient of correlation for the experimentals was +.61, and for the controls +.70, a difference of .09. The standard error of the difference between coefficients of correlation was .37. The ratio of the difference between coefficients of correlation to the standard error of that difference was .25. Thus, the chances are three to two that the derived difference of .09 was in favor of the control method. For practical purposes, although slightly in favor of the control method, the difference was inconclusive.

When experimental and control groups were compared in terms of the gains made by individual teams of matched pairs the results were also inconclusive. In the first semester fifteen of the experimentals exceeded their control mates in gains, while twelve controls excelled their partners and there were two ties. This is a five to four advantage for the experimentals. In the second semester the controls exceeded their experimental mates in twenty-one instances, the experimentals excelled in fifteen instances, and there were two ties. This is a seven to five advantage in favor of the controls. The combined figures revealed that thirty of the experimentals exceeded their control mates in gains, while thirty-three of the controls excelled their partners, and there were four ties. (The experimental group for the first semester gained a mean of 10.0 score points; the control group gained 8.7 score points. The mean difference between gains thus is 1.4 in favor of the experimentals. During the second semester the matched pairs from the experimental group gained an average of 8.2 score points, while the mean control group gain was 11.2. The mean difference is 3.0 in favor of the controls.)

Utilization of Learning Potential

Was there a significant difference between the experimental and control groups in terms of utilization of potential (IQ)? A coefficient of correlation was computed to determine the relationships between IQ's and final test scores. The coefficient for the matched pairs of the control group was +.70, for the experimental group members +.61. Both correlations are significant. The coefficients for the experimental group thus dropped from

+65 for the first test to +61 for the final test, while the control group improved from +68 to +70. These changes are non-significant. The difference at the end of the semester represents a slight but inconclusive gain in favor of the controls. The relationship between intelligence and achievement in United States history course content remained practically constant during the use of both teaching methods.

A coefficient of correlation between initial rankings as determined by the initial history test and rankings based on results when this same test was given at the end of the semester was also computed. The coefficient for the control group members was +.73; for the experimental, +.68. There is no significant difference between the two. With both methods, therefore, those students with high initial history test scores finished the course among those with the highest test scores. And those in the lower ranks tended to remain in the lower group.

GAINS IN RELATION TO TOP, MIDDLE, AND LOW THIRDS OF IQ'S

Further analysis was made of the effect in terms of gains of the two teaching techniques on high, middle, and low intelligence groupings. In Table I, the IQ scores for the sixty-seven matched pairs have been arranged in descending order, and then divided into thirds. Gains in relation to top, middle, and low thirds of IQ scores are given for experimental and control group matched pairs.

TABLE I

Gains in Learning Basic United States History Course Content in Relation to Top, Middle, and Low Thirds of IQ's for Sixty-seven Matched Pairs

	<i>Subjects Per Group</i>	<i>Mean IQ's</i>	<i>Mean Initial Test Scores</i>	<i>Mean Final Test Scores</i>	<i>Mean Gains</i>
<i>Experimental Group</i>					
Top Third	22	116.5	54.0	65.6	11.6
Middle Third	23	102.9	51.3	58.9	7.6
Low Third	22	90.0	48.6	56.5	7.9
<i>Control Group</i>					
Top Third	22	116.3	54.1	68.4	14.3
Middle Third	23	103.0	51.1	61.8	10.7
Low Third	22	88.4	49.6	55.4	5.8

GAINS IN RELATION TO TOP, MIDDLE, AND LOW THIRDS OF INITIAL TEST SCORES

Effect of the two teaching methods on high, middle, and low groups in terms of initial position on the history learning curve was also studied. In

Table II, the first test scores for the matched pairs have been arranged in descending order and then divided into thirds. Gains were computed.

TABLE II

Gains in Learning Basic United States History Course Content in Relation to Top, Middle, and Low Thirds of Initial Test Scores for Sixty-seven Matched Pairs

	<i>Subjects Per Group</i>	<i>Mean IQ's</i>	<i>Mean Initial Test Scores</i>	<i>Mean Final Test Scores</i>	<i>Mean Gains</i>
<i>Experimental Group</i>					
Top Third	22	108.1	58.1	64.3	6.2
Middle Third	23	103.6	51.6	61.0	9.4
Low Third	22	97.8	44.2	55.7	11.1
<i>Control Group</i>					
Top Third	22	108.2	57.0	68.8	11.8
Middle Third	23	102.7	52.0	61.4	9.4
Low Third	22	96.8	45.8	55.4	9.6

Findings and Conclusions

Following are findings which resulted from investigation of the questions posed in this study:

1. Is there a difference in the amount of basic United States history content learned when the indicated teaching methods are compared?

There was no significant difference between the amount of gains in history course content achieved by the matched pairs taught by the traditional pattern of instruction and the pairs taught by a speech activity centered approach.

2. Is there a difference in the extent to which students fulfill the promise of their IQ's in learning United States history when the indicated teaching methods are compared?

The relation between intelligence and achievement in United States history course content remained practically constant during the use of both teaching methods.

3. Is there a difference in the gains made by low, middle, and high IQ groups when the indicated teaching methods are compared?

The control group achieved slightly larger numerical gains in top and middle thirds, and the experimentals in the low third. In both groups the greatest gain was made by the top third. (See Table I)

4. Is there a difference in the gains made by low, middle, and high rankings, as established by the initial examination in history, when the indi-

cated teaching methods are compared?

Gains were the same for the two middle thirds. The low third in the experimental group achieved slightly greater gains than the control group low third. The top third in the control group, however, made a gain almost twice as large as that made by the top third of the experimental group. The top third of the experimental group made the smallest amount of gain of any of the thirds. (See Table II)

Summary

The similarity of achievement in learning basic United States history course content acquires significance when it is recalled that approximately one-half of the course time in the experimental classes was devoted to student speaking or student led class discussion, while in the control group this time was spent mainly in silent reading, writing, and in lectures by the teacher. The relationship between intelligence and achievement also remained constant in both groups. The only striking disparity was among the top thirds of the two groups in terms of initial rankings, where control group pairs gained almost twice as much as their counterparts.

The over-all results would seem to indicate that the particular approach to teaching in terms of method is not as important as is the individual teacher's training, philosophy, experience, and enthusiasm for the approach he is employing. Speech activities may profitably be included in the history course; this is especially true when the major focus is upon issues, movements, and people. The teacher trained in speech as well as in history can do an effective job of teaching both.

An outgrowth of the study is that the control group teacher intends in the future to include more student speech activities than previously scheduled, especially in classes of bright pupils. The experimental group teacher will do more lecturing, and include more formal drill on the course content. Thus, re-evaluation is in process in an effort to discover a better answer to the original over-all question posed in this study: how much speech may profitably be included in the United States history course?

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Perceptions of the Role of the School Psychologist

SIDNEY A. INGLIS, JR.

The purpose of this study was to establish some criteria for defining the scope and function of the school psychologist in order to enable teachers and administrators to utilize more effectively the services of this specialist, and to aid administrators in developing a job analysis for setting up new positions.

As part of this central purpose, it was the intent to provide objective information which would:

1. Stimulate thought about the problem and inspire additional studies in an effort to further enlarge upon a definition of the role of the school psychologist.
2. Aid in the establishment of valid criteria for training and certification of school psychologists at the college level.
3. Provide data from teachers, administrators, and school psychologists concerning which specific duties are conceived by each group as being within the scope of the school psychologist's role and to rank these in order of importance.
4. Determine whether there are any significant differences in opinion between each of the three groups regarding the relative importance of specific duties.

The writer's experience has indicated that few teachers, administrators, or persons engaged in psychological services have a clear-cut conception of the role of the school psychologist; that is, where does his responsibility begin, where does it end, and to what depth should he operate in performing various services?

Verdun Trione, writing in the May, 1957 issue of the *California Journal of Educational Research*, was similarly impressed with the lack of objective

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evidence in this area. His principal concern arose from the fact that there may come a time when the school psychologist is called upon to act as a source of expert testimony in a court of law. If this is to come about, Trione reasons, there must be a much clearer definition of specific training of school psychologists. He proposed that a study be made, based on certain hypotheses.¹ Other studies reveal that the psychologist's responsibilities vary from one setting to another—depending upon many factors.

Method of Study

In an effort to obtain a population sample of sufficient size so as to inspire confidence in the results, and yet to enable the study to be practical in terms of time and effort on the part of the researcher, it was decided to study a certain portion of Sacramento County, namely:

1. Teachers and administrators of Arden-Carmichael Union School District, an elementary school district of eight thousand children and over three hundred certificated personnel at the time of the study.

2. The San Juan Union High School District, a secondary school district of four thousand children and nearly two hundred certificated personnel at the time of the study.

3. The school psychometrists and school psychologists of Sacramento County, including those employed in the two school districts mentioned—a total of fifteen.

Effort was made to obtain data from individuals operating within the same geographical area and at the same chronological time. It was soon realized during the course of the development of a suitable instrument to gather data that the measurement of conscious and/or unconscious attitudes—based upon years of emotional experience with the term “psychologist” on the part of individual members of the population to be studied—would be most difficult. Therefore, the object of the study became the gathering of information about phases of the school psychologist's role which could be objectively identified. This developed into the formation of a questionnaire which requested the respondee to react in terms of his knowledge or belief. It was hoped that from this could be formulated a picture of what this population *believes* that a school psychologist is and what he should and should not do professionally.

The study does not attempt to measure emotional conceptions or impressions of the school psychologist *as he might be reacted to in a real situation*. It does not attempt to measure *how deeply* the psychologist should penetrate each type of activity, nor under what circumstances. In effect, it provides only a “forced choice” to the respondee. These limitations, it is

¹Verdun Trione. “Duties of School Psychologists,” *California Journal of Educational Research*, 8:121-122, May, 1957.

hoped, will be partially overcome by the knowledge derived from the study and the way it is utilized by administrators and school psychologists to orient other teachers, administrators, and psychologists. In an attempt to ameliorate this condition, an item in the questionnaire has the respondent react, in a non-structured way, to the term "school psychologist" by asking him to write his own definition of the term, and by providing a space for "remarks."

It was decided that a questionnaire would be the most practical method of obtaining the desired data. While some form of personal interview technique would be more desirable in terms of determining attitudes and of gaining more valid responses to each item, the factor of obtaining adequate population size precluded this method.

Discussion of Results

Results of the study are presented in tabular form. Percentages do not add to 100 per cent in all cases because a column labeled "undecided" used in the survey instrument was not included in this paper.

TABLE I

Rank Order of Duties that School Psychologists "Should Do"

As Perceived by Teachers and Administrators

(In Terms of Percentage)

(N = 325)

<i>Activity</i>	<i>Percentage</i>
Participate in case conferences.....	92.0
Be responsible for placement of pupils in special classes.....	84.0
Administer individual intelligence tests.....	78.5
Do psychotherapy with serious problems.....	78.2
Coordinate non-school agencies to help the school with serious problems....	75.0
Aid in-service training of teachers in child-study techniques.....	74.0
Administer a guidance program.....	67.0
Supervise achievement testing program.....	60.0
Give program counseling information.....	56.0
Engage actively in research on current problems (during working hours)....	52.0
Make home calls to truant children's homes.....	29.6
Help teachers with personal problems.....	29.2
Participate in formation of district policies.....	28.6
Interpret the school and its curriculum to parents, community (via PTA, etc.).....	28.0
Help score achievement tests.....	27.0
Help in curriculum construction.....	25.0
Do clerical work related to pupil records.....	10.0
Teach remedial reading classes.....	6.6
Handle day-to-day behavior problems.....	6.2

It is interesting to note that the same duties were perceived by the highest percentage (fifty or more) of both groups (teachers-administrators and psychologists). Some of these duties have been commonly associated with the school psychologist's function: participation in case conferences, administration of individual intelligence tests, and responsibility for placement of pupils in special classes. However, it is encouraging to observe that certain other duties (which are operative on a comprehensive, more coordinative level) have also been perceived by both groups as being within the psychologist's role. Specific reference is made to aiding in-service training of teachers in child-study techniques, and coordinating non-school agencies to help the school with serious problems. Some routine duties (clerical work, scoring achievement tests) were low in per cent.

TABLE II

Rank Order of Duties that School Psychologists "Should Do"

As Perceived by Psychological Workers

(In Terms of Percentage)

(N = 15)

Activity	Percentage
Aid in-service training of teachers in child-study techniques.....	100
Participate in case conferences.....	100
Coordinate non-school agencies to help the school with serious problems.....	100
Administer individual intelligence tests.....	93
Administer a guidance program.....	87
Engage actively in research on current problems (during working hours)....	87
Be responsible for the placement of pupils in special classes.....	80
Help in curriculum construction.....	60
Participate in formation of district policies.....	60
Help teachers with personal problems.....	53
Interpret the school and its curriculum to parents, community (via PTA, etc.).....	47
Give program counseling information.....	47
Supervise achievement testing program.....	40
Do psychotherapy with serious problems.....	33
Make home calls to truant children's homes.....	14
Help score achievement tests.....	7
Teach remedial reading classes.....	7
Handle day-to-day behavior problems.....	7
Do clerical work related to pupil records.....	0

Also encouraging for the profession, the writer believes, is that 52 per cent of the teacher-administrator group saw the psychologist as engaging actively in research during working hours. This would seem to be an indication that the psychologist has a professional obligation to expand the frontiers of knowledge in the area of educational school psychology.

TABLE III

Rank Order of Duties That School Psychologists "Should Not Do"

As Perceived by Teachers and Administrators

(In Terms of Percentage, 50 per cent or more)
(N = 325)

<i>Activity</i>	<i>Percentage</i>
Handle day-to-day behavior problems.....	85.0
Do clerical work related to pupil records.....	80.0
Teach remedial reading classes.....	79.0
Help score achievement tests.....	60.0
Make home calls to truant children's homes.....	56.0
Participate in formation of district policies.....	55.4
Interpret the school and its curriculum to parents, community (via PTA, etc.).....	55.0
Help teachers with personal problems.....	51.0
Help in curriculum construction.....	50.0

TABLE IV

Rank Order of Duties That School Psychologists "Should Not Do"

As Perceived by Psychological Workers

(In Terms of Percentage, 50 per cent or more)
(N = 15)

<i>Activity</i>	<i>Percentage</i>
Do clerical work related to pupil records.....	100
Help score achievement tests.....	93
Teach remedial reading classes.....	93
Handle day-to-day behavior problems.....	93
Make home calls to truant children's homes.....	73
Do psychotherapy with serious problems.....	53

A rather striking finding is in connection with the psychologist's engaging in psychotherapy (see Table V). A decided difference in opinion is observed for the two groups. This disagreement may indicate a significant lack of knowledge on the part of teachers of the school psychologist's training, his work load in most school districts, or of the term "psychotherapy." It may also be indicative of the type of functional aid that educators on the "firing line" strongly desire, and would seem to have indications for the school psychologist in terms of orientation of teachers and administrators.

TABLE V

**Greatest Areas of Disagreement
Between Teachers-Administrators and Psychological Workers**

(In Terms of Percentage)

<i>Activity</i>	<i>Teachers-Administrators</i>	<i>Per cent</i>	<i>Psychological Workers</i>	<i>Per cent</i>
Do psychotherapy with serious problems	"Should"	78.2	"Should not"	53.0
Help in curriculum construction	"Should"	25.0	"Should"	60.0
Participate in formation of district policies.....	"Should"	28.6	"Should"	60.0
Help teachers with personal problems	"Should"	28.6	"Should"	53.0

TABLE VI

**Greatest Areas of Indecision
Between Teachers-Administrators and Psychological Workers**

"Undecided" or No Answer
(In Terms of Percentage)

<i>Teachers-Administrators</i>		<i>Psychological Workers</i>	
<i>Activity</i>	<i>Per cent</i>	<i>Activity</i>	<i>Per cent</i>
Help in curriculum construction..	25	Supervise achievement testing programs	47
Engage actively in research on current problems (during working hours)	25	Participate in formation of district policies	27
Give program counseling information	23	Interpret the school and its curriculum to parents, community (via PTA, etc.)	26

Survey findings indicate some agreement, some disagreement, and some measure of confusion concerning certain specific duties of the school psychologist. This would seem to indicate that psychological workers would be well advised to be conscious of their orientation responsibilities regarding their proper role in the school setting, and that they must not only carefully evaluate their own function, but actively seek to inform other school personnel of the nature of their role.

Reading Ability of College Home Economics Students

DOROTHY M. LEAHY

It is assumed that one who reads rapidly, understands the meaning of words, and readily comprehends what he reads should achieve successfully in college work. In fact, skill in reading is considered the most important tool for a college student to possess, regardless of his educational objective.

As an adjunct to the study of intellectual ability and interests of college home economics women (1), which pointed up the need for selective recruitment and for accreditation of institutions offering professional education in home economics, the present study on reading ability was undertaken. The purpose is to find out how well home economics women students read and comprehend what they read. What is the extent of their vocabulary? How do home economics students compare with other college students in reading ability?

To answer these questions data derived from the use of the *Cooperative English Test: C2: Reading Comprehension* (C.E.T.), and the *American Council on Education Psychological Examination for Freshmen* (A.C.E.) were used. The tests were included in a battery administered to entering students in home economics over a four-year period between February, 1953, and February, 1957. The data represents a stratified random sample drawn from 477 women students in home economics. The sample was chosen by selecting every third student in each class from the freshman to graduate levels. Scores for each class level on all parts of reading comprehension as well as the total reading scores for the C.E.T. were used.

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To these the method of analysis of variance was applied. All computations were carried to three decimal places and then rounded to one. The 5 per cent level of confidence was accepted as the basis of significance.

How do home economics students perform and is there any difference between classes in performance on the C.E.T.? Table I gives the distribution measures for each test according to class and for the total group in reading comprehension on the Cooperative English Test. The range, mean, and standard deviation are given and are used to describe each class sample.

TABLE I
Distribution Measures of Reading Scores on Cooperative English Test and National Norms*

Reading Test	Class	N	Low	High	Mean	SD	National Norm	
							Mean	SD
Vocabulary	Freshman	46	79	58.8	6.6	58.9	9.5	
	Sophomore	38	85	58.6	9.7	61.3	9.6	
	Junior	47	85	59.6	6.3	62.7	9.6	
	Senior	46	76	61.7	7.5	63.8	9.7	
	Graduate	48	77	63.5	9.2			
	Total Group	38	85	59.7	7.6			
Speed	Freshman	42	78	58.3	7.3	62.3	10.9	
	Sophomore	48	73	58.6	6.8	63.1	11.2	
	Junior	43	76	57.9	6.6	64.5	11.3	
	Senior	44	70	57.5	6.0	65.5	11.3	
	Graduate	55	67	60.0	4.0			
	Total Group	42	78	58.2	6.7			
Level	Freshman	39	77	57.7	8.3	61.2	10.0	
	Sophomore	45	85	58.9	9.6	62.6	10.4	
	Junior	37	85	56.9	8.4	64.2	10.5	
	Senior	48	77	56.2	6.7	65.2	10.3	
	Graduate	50	77	62.0	7.0			
	Total Group	37	85	57.8	8.4			
Reading Total	Freshman	57	41	74	58.8	7.8	61.9	10.0
	Sophomore	28	44	76	58.6	8.0	63.4	10.1
	Junior	45	41	74	58.2	7.0	64.9	10.0
	Senior	20	50	72	58.5	6.5	66.4	10.1
	Graduate	10	56	73	57.0	5.5		
	Total Group	160	41	74	58.5	7.4		

*National norms based on 50,000 students in 90 liberal arts colleges.

An inspection of Table I shows the means for the total reading scores of all classes to be very similar. Contrary to expectations the mean for freshmen is the highest, 58.8, SD 7.8, indicating that the performance in general of the freshmen is better than the graduates who attained a mean of

57.0, SD 5.5. The mean for level of comprehension is highest for graduates, 62.0, SD 7.0, and lowest for seniors, 56.2, SD 6.7. A similar situation holds for speed of comprehension. Here the mean for graduates is 60.0, SD 4.0 and for seniors 57.5, SD 6.0, while freshmen attained a mean of 58.3, SD 7.3. Only on the vocabulary test is there regular progression from freshman, 58.8, SD 6.6 to graduate 63.5, SD 9.2. When the latter is contrasted with the national norms that were established on 50,000 students in 90 liberal arts colleges, the home economics freshmen compare favorably. However, the other class groups fall slightly below the national norms.

The differences between the mean scores of the several class groups for each test were analyzed for variance and found not to be significant at the 5 per cent level, except in the case of vocabulary. (See Table II.) When the "t" test for significance was applied, a significant difference was found to exist only between the freshman and graduate classes. This is as one might expect, since graduates have had more education and experience and admission to the graduate division is more selective. Since no significant differences were found to exist among the undergraduate classes, it may be concluded that they are more alike than different in their performance in reading comprehension.

TABLE II

Ratio of Variances: Between Groups and Within Groups on C.E.T.

<i>Test on Data</i>	<i>Mean Square Variance Between Group Estimate</i>	<i>Mean Square Variance Within Group Estimate</i>	<i>F.</i>	<i>P.</i>
C.E.T.				
Vocabulary	5.91	2.32	2.55	.05
Speed	.515	1.84	3.57	.00
Level	3.0	2.87	1.05	.00
Total	2.8	2.19	1.28	.00

How do home economics students compare with other students on the C.E.T.? The mean scores for reading total are practically the same for all undergraduate classes, 58.2, SD 7.0 to 58.8, SD 7.8. (See Table I.) When compared with the national norms, freshmen are highest, but, nevertheless, 3 points below the national mean, and seniors are 8 points below. The total mean score for all classes in home economics on Reading Total of C.E.T. is 58.5, SD 7.4, placing the group at approximately the 49th percentile for entering freshmen and at the 29th percentile for seniors according to the national norms. However, freshman home economics students are only

one-tenth of a point (58.8) below the national norm (58.9) on the vocabulary test, but the upper classes (sophomore, junior, and seniors) are consistently 2 to 3 points below for their respective classes. In speed of comprehension, students in home economics range from 4 (freshman) to 8 (senior) points below the national norms. A similar relationship exists for level of comprehension. Here, the freshmen did the best, but, nevertheless, they are 4 points below the norm and the seniors are 9 points below.

According to norms for Reading Total, C.E.T., established for students in the School of Education (juniors, seniors, graduates) at U.C.L.A., the mean score for home economics is approximately at the 28th percentile. It is equivalent to that for entering freshmen in education. Webber, in a study of education majors in the College of Applied Arts at U.C.L.A., secured a mean score of 59.7, SD 6.6 on Reading Total for Home Economics, placing this group at the 30th percentile. It was higher than that obtained for physical education, 56.5, SD 13.5, but lower than art, 64.6, SD 9.2; business education, 61.5, SD 7.1; and music, 60.9, SD 8.3.

It is evident from these data that home economics students enter as freshmen with ability in vocabulary comparable to that of other freshmen, but their performance in subsequent years shows a regression according to the national norms. Ability in speed and level of comprehension tends to remain relatively constant throughout all class levels except at the graduate. In no instance, however, do the upper classmen attain the national norms or those established by the School of Education at U.C.L.A.

How does the performance of home economics students on C.E.T. compare with that on A.C.E.? To discover whether there is any relationship between performance on A.C.E. and C.E.T., a product moment correlation coefficient on gross scores for A.C.E. and Reading Total for C.E.T. was computed. As shown in Table III, a correlation of .64 was obtained. Moreover, when the "t" test for significance of the correlation was applied, it was found to be significant at the 1 per cent level. Hence, it appears that there is some association between a student's performance on A.C.E. and C.E.T. In other words, a student who performs well on the A.C.E. could be expected to do correspondingly as well on the C.E.T. Further scrutiny of Table III shows a correlation of .76 between scores on the linguistic test (L-scores) of A.C.E. and the vocabulary test of C.E.T. This statistic is also significant at the 1 per cent level. The latter indicates that from a student's performance on the linguistic test of A.C.E. one might predict with a fair degree of accuracy a student's approximate level of performance on the vocabulary test of C.E.T. and vice versa. Correlations between part scores of C.E.T. and gross scores on A.C.E. ranged from .51 to .62, the former for the test on level of comprehension and the latter for speed of comprehension. Both correlations were significant at the 1 per cent level. These data give support to the theory of the importance of reading ability and scholastic aptitude.

Is there any relationship between reading ability as measured by C.E.T. and scholastic achievement at college as measured by a grade point average (G.P.A.)? To find the answer to this question a product moment correlation between scores on Reading Total for C.E.T. and grade point averages (G.P.A.) for home economics students in attendance at U.C.L.A. for one year or longer was computed. As shown in Table III, a correlation of .28 was obtained. In addition, correlations between scores on level of comprehension and G.P.A. as well as speed of comprehension and G.P.A. were obtained, the former .27 and the latter .26. The magnitude of the correlation is probably due to the narrow range of possible grades (1.00-3.00) and the fact that students who did not achieve at least a C or 1.0 average had withdrawn from college before completion of one year in residence. When the "t" test for significance was applied, all correlations between C.E.T. and G.P.A. were found to be significant at the 1 per cent level. Therefore, it may be said that there is some association between a student's ability to perform on the C.E.T. and his ultimate success in college as indicated by grade point average. More specifically, a student's ability to read rapidly and to understand what he reads contributes considerably to his ability to achieve successfully at college.

TABLE III
Correlations Between C.E.T., A.C.E. and G.P.A.

C.E.T.	Gross Scores A.C.E.	L-Scores A.C.E.	G.P.A.
Reading Total	.64	.69	.28
Vocabulary		.76	
Level	.51		.27
Speed	.62		.26

In a previous study concerned with academic ability and interests (1), there was no significant difference between majors (fields of specialization) in home economics and their scholastic ability as evidenced by performance on the A.C.E. Likewise, in this study there is no significant difference between the mean scores in Reading Total and majors. Moreover, in the analysis of the difference between mean scores in Reading Total and Attrition (those who withdrew, were dropped by the University, transferred, and graduated), there is no significant difference. Thus, it appears that the demand for reading ability is not differentiated by specialization and as far as reading ability is concerned a student might achieve equally well in any major in home economics.

The results of this study pose several queries: namely; is the nature

and content of the home economics curriculum such as to hold relatively constant the student's reading ability? Is it possible that the emphasis on laboratory work fails to enhance reading ability? Is there need to review the content of college courses in home economics in light of the intellectual challenge which they present?

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Empirical Research . . .

(Continued from page 14)

areas of educational research—begins with the problems which initiate inquiry and not with a preconceived method, educational researchers are not going to be able to distinguish between the basic types of problems with which they must deal in education; and not recognizing the difference in types of problems and inquiries, the need for differing methods is not going to be felt. Consequently, normative educational problems are not going to be solved—unless and until educational philosophers bring their techniques of analysis into play upon the empirical field.

To do less is to confirm the suspicions of many researchers that philosophers of education have nothing to offer to the conduct of empirical research in education, and consequently, that philosophy of education has nothing to offer to the practice of education.

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Research News and Views

David Ryans, formerly of UCLA and the Advisory Council, and now chairman of the Department of Educational Psychology, University of Texas, writes, "... I hope that I can continue to count myself as at least partially a Californian and be included in the fold of California researchers." Dr. Ryans is as busy as ever. He is the president-elect of the Division of Educational Psychology of the American Psychological Association, and has been appointed a member of the Board of Editors of the *Review of Educational Research*. In November he presented a summary of the Teacher Characteristics Study to the Invitational Testing Conference in New York.

Arthur P. Coladarci, Stanford University, also a member of the Advisory Council, has been appointed to a seven-man board which will supervise the research funds made available to the National League for Nursing. This board is to establish policies for research proposals, evaluate proposals submitted to the board, and allocate money for research.

Merle Elliott, Director of Research, Oakland City Schools, and a member of the Advisory Council since its inception, has been elected president of the California State Psychological Association. Dr. Elliott will take office in April, 1959.

Henry Weitzel, Research Director, Pasadena City Schools, indicated that the research directors of several city and county schools held an informal meeting during the Tenth Annual Research Conference in San Mateo last November to discuss methods of reporting standardized test information to parents, boards of education, and the press. Represented were Alameda County, Burbank, Los Angeles, Oakland, Palo Alto, Pasadena, San Diego, San Francisco, Santa Monica, and Stockton.

There will be "no letup in demands for additional school staff and facilities in the next 25 years," says N. L. Engelhardt, Jr. in a report issued by Engelhardt, Engelhardt, Leggett, and Cornell, Educational Consultants. The pamphlet, complete with formulas and graphs, has been sent to school superintendents, but a limited number of copies are available from the firm at 221 West 57th Street, New York 19, New York.

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The California Journal of Educational Research welcomes original manuscripts on educational research. The types of material desired are:

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2. Digests of theses and dissertations that have practical application. Such theses and dissertations, however, must officially be approved for publication by a member of the Editorial Board (see names on inside of front cover) or by the college or university at which the research was done.
3. Studies that present novel, but tested, approaches to the solution of educational problems.

Manuscripts, except for feature articles, should be limited to approximately 1500 words. They should be typewritten double-spaced, on one side of the paper, and submitted in duplicate. Only original manuscripts will be accepted for publication.

Tables, charts and graphs often enhance a research report. When used, they should be clearly and accurately labeled. They should also be inked to size and their places designated in the manuscript.

Footnotes should be complete as to author, title, publisher, date and pages. Bibliographies accompanying manuscripts should also be complete as to data, and should be arranged alphabetically by authors.

Manuscripts will not be returned unless the author so requests, in which case a stamped, self-addressed envelope should accompany the manuscript.